

Submitted Abstract

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Title:	THE MESSAGE FROM QUASAR ABSORPTION LINES
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Abstract:	In addition to being of intrinsic interest themselves, bright distant quasars are particularly valuable as probes of the intervening gas clouds and galaxies imprinted on their spectra in absorption. Surveys for distant absorption line systems have been driven historically by the desire to detect galaxies in the very early stages of evolution, before most of the gas has turned in to stars. Because the gas should be neutral and at high column densities (comparable to that in our own Milky Way galaxy) it will leave a spectroscopic imprint on the light emitted by a background quasar. Combined with modern computer simulations, observations of the high and low column density neutral hydrogen absorbers are yielding new information about the ionization state, metal content, and structure in the early Universe. The galaxies and gas clouds that intercept the quasar line-of-sight provide unbiased samples selected without regard to their surface brightness, luminosity, or star formation rate. Though direct studies of individual very young galaxies are now possible, those selected by the absorption lines they produce in quasar spectra still provide the only means to study in detail their kinematic properties at high resolution. This information can be combined with the color and morphological information obtained from imaging to provide a complete picture of individual galaxies in the early Universe. Studies of quasar absorption line systems continue to provide new clues about the birth and evolution of galaxies and the environments in which they form.